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EFFECT OF POOL WATER ON THE PH OF SALIVAIN CHILDREN

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РЕЗЮМЕ

Цель исследования. *Механизм влияния воды бассейна на pH слюны.*

Материалы и методы. *Было проведено исследование pH ротовой полости до визитабассейна и немедленно после занятий плаванием у 70 детей в возрасте от 6 до 15 лет (34 девочки, 36 мальчиков) с использованием лакмусовой бумаги (pH тест) от 1.0 до*

Исследование осуществлялось в 2 этапа - в первый день pH воды в бассейне составляло 7,4, был проведен анализ показателя pH у 59 детей (15 девочек, 44 мальчика); во второй день - pH 6,6, участие приняли 70 детей (34 девочки, 36 мальчиков).

Занятия в бассейне продолжались в течение 1,5 часов.

Результаты. *При исследовании в первый день pH в бассейне составлял 7,4 (слабощелочная среда). При данном у 4 детей (6%) pH осталось на прежнем уровне, у 55 детей (94%) показатель pH отклонился в щелочную сторону. Максимальное изменение pH слюны - 0,9. При осуществлении оценки pH ротовой полости у детей во 2 день pH в бассейне составлял 6,6 - слабокислая среда. При данном у 11 детей (13%) pH осталось на прежнем уровне, у 3 детей (4%) pH отклонилось в щелочную сторону, у 56 (83%) - pH отклонилось в кислую сторону. Не изменилось pH слюны ротовой полости при pH 7,4 у 6%* детей, а при pH 6,6 - у 13 %.

Вывод. *Ребенку, долгое время пребывающему в бассейне, нужна защита в виде профилактических мер, которые направлены на предупреждениепоявления кариеса, эрозий и зубного камня.*

RESUME

Purpose of research. How pool water affects the pH of oral saliva.

Materials and methods. *A study of oral pH before swimming and immediately after swimming was conducted in 70 kids aged from 6 to 15 years (by of these ,34 are girls, 36 are boys) use litmus paper (pH test) from 1.0 to 14.0.The study was conducted in second stages - on the fi rst day, the pH there was*

water in the pool 7.4, the pH level was assessed in 59 kids (by of these 15 are girls, 44 are boys); on the second day, the pH was 6.6, 70 kids (by of these 34 are girls, 36 are boys) took part. Lessons in the pool lasted one and half hours. ***Results.*** *During lesson on the fi rst day, the pH in the pool water was 7.4 (slightly alkaline medium). In 4 kids (6%), the pH remained at the same level, and in 55 kids (94%), the pH level deviated to the alkaline side. The maximum change in the pH of saliva to 0.9.When assessing the pH of the oral cavity in kids on day 2, the pH in the pool water was 6.6-slightly acidic environment. In 11 kids (13%), the pH remained at the same level, in 3 kids (4%), the pH deviated to the alkaline side, and in 56 (83%), the pH deviated to the acidic side.*

The pH of oral saliva didn't change at pH 7.4 in 6 of kids , and at pH 6.6-in 13 %. Conclusion. Kids which stays in the pool water for a long time needs protection in form of preventive measures aimed at preventing the occurrence of caries, erosion and tartar.

Key words: *enamel erosion, pH of saliva of the mouth, swimming.*

THE URGENCY OF THE PROBLEM

As far as we know, actually, that athletes engaged in swimming, not counting osteochondrosis of the cervical spine, acute otitis media, barotrauma and other diseases, often have enamel erosion. In this regard, the mechanism of the effect of pool water on the pH of the oral saliva has aroused great interest. The following tasks were established: to find out whether the pH of the water from the pool affects the pH of the oral saliva, and if so, to find out how, and draw conclusions about the need for prevention and protection against dental pathology in children spending a long time in the pool, which will undoubtedly help prevent the spread of occupational diseases. In accordance with SanRaR "Sanitary rules and regulations for the design, explication and operation of swimming pools" when chlorination of water and any method of water treatment, the pH value (pH) must be maintained within 7.2-7.6, but not more than 7.8. When the pH value increases, it must be adjusted by dosing a pH-reducing agent (hydrochloric or sulfuric acids) into the pool water supply pipeline after the disinfectant is introduced. But nevertheless, these requirements are not met in all swimming pools, and monitoring the maintenance of the required value of the hydrogen index may be carried out in bad faith, which leads to fl uctuations in the pH of saliva in the oral cavity of a person engaged in swimming. As a rule, the acidity of mixed human saliva is 6.8-7.4 pH, but at high salivation rates it reaches 7.8 pH .Saliva with low pH values leads to focal demineralization of tooth enamel, in fact, which in turn leads to the appearance of erosion of hard tooth tissues and caries.

If the acid-base balance shifts to the acidic side, it increases the activity of proteinases of both bacterial and leukocyte origin. Acids accumulate and their excessive accumulation leads to demineralization.If the acid- base state changes to the alkaline side, this contributes to the formation of plaque.Alkalinization of Saliva leads to an increase in the concentration of inorganic phosphate (PO4) - which forms an insoluble calcium phosphate with Ca2+ ions, which gradually turns into a more stable form of hydroxyapatite, that is, the process of plaque mineralization begins.

Objective: to study the effect of pool water on the pH of oral saliva

Materials and methods: A study of the pH of the oral cavity was carried out before visiting the pool and immediately after swimming in 70 children aged 6 to 15 years (34 girls, 36 boys) using litmus paper (pH test) from 1.0 to 14.0. One end of the paper is immersed in the test liquid for 2-3 seconds, after which the changed color of the paper is compared with the supplied scale and the values are calculated. The test strip was immersed in the pool for calculating the pH of the water and immersed in the oral cavity of the subjects to study the pH of the oral fl uid before and after swimming.

The study was carried out in 2 stages - on the fi rst day the pH of the water in the pool was 7.4, the pH level was assessed in 59 children (15 girls, 44 boys); on the second day - pH 6.6, 70 children (34 girls, 36 boys) took part. The sessions in the pool lasted for 1.5 hours.

Results and discussion: During the study on the fi rst day, the pH in the pool was 7.4 (slightly alkaline medium) - the indicator was obtained by immersing litmus paper in water. The results of the study of the pH of the oral fl uid of children were distributed as follows:

pH before entering the swimming pool: 6.80± 0.30

pH after swimming: 7.5±0.4

At the same time, in 4 children (6%) the pH remained at the same level, in 55 children (94%) the pH level deviated to the alkaline side. Themaximumchangein saliva His 0.9.

When assessing the pH of the oral cavity in children on day 2, the pH in the pool was 6.6 - a weakly acidic environment (the indicator was obtained by immersing litmus paper in water), the results of the study were distributed as follows:

pH before entering the swimming pool: 7,2±0,3

pH after swimming: 6,65±0,65

At the same time, in 11 children (13%) the pH remained at the same level, in 3 children (4%) the pH deviated to the alkaline side, in 56 (83%) - the pH deviated to the acidic side.

The maximum change in the pH of the oral saliva is 0.9.

So, we see that the water in the pool affects the pH of the oral cavity in children, therefore, if the child often stays in the pool, this can lead to pathologies in the oral cavity.

In this case, the infl uence of a weakly acidic medium is less than the infl uence of a weakly alkaline one. The pH of oral saliva did not change at pH 7.4 in 6% of children, and at pH 6.6 - in 13%. Interestingly, in a weakly acidic environment, a change to the alkaline side was also observed. Presumably, this is due to the absence of objective data on the examination of the child and the history of life in this research work.

A child who stays in the pool for a long time needs protection in the form of preventive measures aimed at preventing the occurrence of caries, erosion and plaque.

Presumably, the following measures will be effective:

Remineralizing therapy (R. O. C. S. medical minerals gel, Remars gel).

Flouride applications to prevent concomitant caries and to strengthen the crystal lattice of hydroxyapatite at home every day, possibly constantly, but always regularly ("Fluoride lacquer", 1-2% sodium fl uoride solutions).

If there is a risk of erosion, limit the use of certain foods (exclude citrus fruits, berries, sweets, carbonated drinks, freshly squeezed juices with vitamin C, canned foods). Include protein in the diet to strengthen the enamel protein matrix and collagen fi bers. Choose products (pastes containing organic calcium, with hydroxyapatite) and hygiene items (correction of the stiffness and structure of the brush bristles, exclude the use of toothpicks), and also teach the correct method of brushing your teeth (vertical movements).

When the alkaline effect of the pH level predominates, it is recommended to pay special attention to the need for professional oral hygiene to clean the surface of the teeth from plaque. Also, the attention of the dentist and the patient should be drawn to the condition of the gums in order to prevent or begin treatment of emerging gingivitis and periodontitis in time.

CONCLUSION:

The presence of a child in the pool affects the pH of the oral cavity in most cases (91%).

The pH of the oral cavity changes in accordance with the pH of the pool water. In a weakly alkaline medium, deviations in pH are observed in the alkaline direction, in a weakly acidic medium, in most cases (83%), in the acidic one.

Changes in the pH to the acidic side can provoke a caries situation in the oral cavity, as well as the occurrence of enamel erosion. A child who is engaged in sports swimming, and therefore spends a lot of time in the pool, is subject to constant changes in the pH of the oral cavity, which increases the risk of pathological changes in the structure of the enamel. Changes in the pH to the alkaline side, in turn, can provoke the appearance of plaque, and, consequently, gum pathologies.

With regular visits to the pool, it becomes necessary to monitor the pH level of the pool water and take preventive measures.

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СРАВНИТЕЛЬНЫЙ АНАЛИЗ БИОМАТЕРИАЛОВ, ПРЕДНАЗНАЧЕННЫХ ДЛЯ ОСТЕОЗАМЕЩЕНИЯ

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ABSTRACT

Atrophy and resorption of bone tissue is an urgent problem of modern surgical dentistry, because the lack of bone tissue is the most common problem in the practice of dentists. The aim of the study was to study the available osteoplastic materials. The study proved the need for further research and development of new osteoplastic materials.

РЕЗЮМЕ

Появление остеопластических материалов и но-вых методов костной регенерации не только реша-ет проблему восстановления объема и плотности челюстных костей, но и значительно улучшает ре-зультаты имплантации.

***Цель исследования**: провести поиск и разработку новых отечественных остеопластических материалов.*

Результаты определения острой токсичности дают возможность считать отечественный пастообразный композиционный материал, относящийся к группе почти нетоксичных материалов, определяемых токсичность материалов согласно международной классификации.

Атрофия и резорбция костной ткани является проблемой, которая для современной хирургической стоматологии актульна, т.к недостаток костной ткани наиболее часто встречающаяся проблема в практике стоматологов. Целью исследования явилось изучение имеющихся остеопластических материалов. Исследование доказало необходимость дальнейшего изучения и разработки новых остеопластичесих материалов.

***Ключевые слова:** остеоиндукция, атрофия кости, биодеградация, резорбция.*

Разработка искусственных биоматериалов, имитирующих состав и свойства натуральной кости и предназначенные для замены повреждённых или утраченных частей тела, человека является одним из основных направлений имплантационной медицины. Биоматериалами называют искусственные материалы, предназначенные для замены повреждённых или утраченных частей тела человека, которые надёжно и физиологично функционируют во взаимодействии с тканями и органами живого организма. Биоматериалы образуют химические связи с живыми тканями, что называется биосовместимостью. Результатом химической реакции является образование слоя биологического апатита (гидроксикарбонатапатит Ca10-x(PO4)6-x(OH)2-y(CO3)x/2+y/2) на поверхности биоматериала, что предопределяет его надежную фиксацию в окружающих тканях [2,9,10,13,17].

Травмы челюстно-лицевой области, патологии периодонта, кисты в области корней зубов, при проведении зубной имплантации зависят часто от нарушения регенерации костной ткани, тканевой микроциркуляции крови в связи с тем, что раны инфицированы, при этом возникает гипоксия тканей и изменения реактивности всего организма от сенсибилизации и возникших очагов инфекции в хронической форме.

Успех восстановительного хирургического лечения при травмах челюстно-лицевой области, заболеваниях пародонта, околокорневых кистах челюстей, дентальной имплантации во многом зависит от процессов регенерации костной ткани, которые протекают зачастую в условиях инфицированной раны, на фоне нарушенной микроциркуляции крови, гипоксии тканей, а также измененной общей реактивности организма ввиду наличия очагов хронической инфекции и сенсибилизации. Образование слоя биоактивного апатита на поверхно-сти имплантата, являясь необходимым условием прямого срастания искусственных имплантатов и